Wild Avian Surveillance Activities Plan

I. Introduction

This portion of the plan applies only to West Nile virus (WNV) surveillance. Wild avian surveillance is not a useful tool for the sporadic occurrence of other arboviruses in Virginia. Virginia data from the past two years indicates that clusters of positive birds early in the season (prior to mid-July) are important indicators of where human cases will subsequently be seen. Obtaining wild avian data can be resource intensive. Recognizing that local resources and WNV activity vary greatly from one jurisdiction to another, the decision on whether or not to include wild avian surveillance as part of a WNV surveillance and response plan will be made at the local level. The Virginia Department of Health (VDH) will work with local, state, federal and non-governmental partners to make the best use of limited resources to utilize wild bird deaths and WNV infections of dead crows (American and Fish), blue jays (*Corvidae* family) and raptors (birds of prey, i.e., hawks, falcons, eagles and owls) as part of a statewide comprehensive surveillance plan.

II. Objective

To provide an appropriate protocol if wild birds are used as part of a WNV surveillance program.

III. Implementation Plan

This surveillance involves two possible components: a **Reporting System** for sightings of dead crows, jays and raptors to track possible increases due to WNV, and/or a **Testing System** of crows, jays and raptors to confirm that WNV is the cause of death. The initial point of contact for the public should be the local health department (LHD) of the county or city in which the citizen has observed the bird unless a different agency has been designated and made known to the public.

A. General - The following statements apply to all types of bird surveillance.

1. **Identification Numbers –** Every dead crow, jay or raptor that is reported, every bird that is transported or in someone's possession under the auspices of the LHD, and every tested bird should have an identification (ID) number. The ID number should be the 3-digit FIPS code of the county or city where the bird was found, the accession number assigned by the county or city, and a two digit number for the year (e.g., 810-0101-05 would be the 101st bird reported from Virginia Beach in the year 2005). Each LHD must enter individual bird information in the VDH avian database prior to shipment to the laboratory. The database will print an appropriate data sheet, which must accompany the bird. The database will also assign each jurisdiction a correct FIPS Code for its VDH ID number. Each bird or swab submitted must have a valid VDH ID number as well as

a hard copy form in order for the Laboratory to proceed with testing. Birds reported or submitted by other government agencies or non-governmental organizations should be managed in the same way.

2. **Permits --** VDGIF is the designated state agency for issuing US Fish and Wildlife Service (USFWS) salvage permits to allow LHDs to transport (or delegate transport of), and designated laboratories to possess, wild birds. As subpermittees, LHDs must keep records of all birds picked up and transported under their auspices. Any person in possession of a bird must have the ID number from the LHD that authorized the collection or transport of the bird. At the end of the year the number of each species of bird that was transported or possessed will be provided by the Office of Epidemiology to VDGIF for reporting to USFWS.

3. **Impact of Specimen Collection** - To minimize the potential impact on individual birds and populations of birds, when possible, samples for WNV surveillance requiring tissue will be obtained from birds that have died, rather than taking samples from live animals. It is anticipated that the only samples taken from live animals would be blood specimens for antibody testing (See III.C.) or oral swabs (See Attachment 1A). To reduce the stress on sentinel wild birds, if possible, blood specimens should be utilized for more than one diagnostic test, for example, other surveillance tests required for investigation of other disease agents.

4. **Laboratory Test Interpretation** - VDH and the Division of Consolidated Laboratory Services (DCLS) will develop clear guidelines for the interpretation of laboratory tests.

5. **Communication of Results -** Testing of specimens and reporting of results by laboratories will occur in a timely manner, allowing for appropriate laboratory quality control. A web-based database developed by the Office of Epidemiology will allow LHDs, the Office of Epidemiology, and DCLS to enter and access bird data. LHDs will be able to access the data for their own district and get positive results as soon as DCLS posts it on the website. Otherwise positive reports will be telephoned, faxed or electronically sent to the Office of Epidemiology, which will notify the involved LHD by telephone or electronic mail. The LHD is responsible for notifying the person who submitted the bird, local government, and other relevant organizations, such as the media.

6. **Release of Information and Confidentiality** - Rapid sharing of surveillance results with government agencies, cooperating non-government organizations and the public is essential for development of appropriate disease prevention and control measures. However, some confidentiality should attach to identification of persons who submit a bird

or find one on their property, or a treating veterinarian, if any. Therefore, to encourage reporting, names and street addresses of dead bird locations, treating veterinarians' names and street addresses, and names and addresses of persons submitting specimens will be kept confidential. Information that will be available to agencies and the public with respect to birds that are tested will include the town, county, and neighborhood where the specimen was collected, the species, the date of collection, and the WNV test results.

B. Reporting System - Dead Wild Birds

1. **Utilization –** Dead bird reports should only be collected, maintained and analyzed if a locality finds them to be of use. Such reports may be unreliable in the early season when most bird deaths will be from something other than WNV. Later in the season, when a higher percentage of bird deaths is more likely to be due to WNV, may be past the time when bird death reports have much predictive value for human disease, i.e. human cases will be occurring at the same time and/or place as when and where dead bird reports are increasing. LHDs may choose to use dead bird reporting as a substitute for bird testing, once a quota of birds testing positive has been reached for an area (See III.C.7.)

2. **Species -** Crows (American and Fish) and blue jays (*Corvidae* family) and raptors (birds of prey, i.e., hawks, falcons, eagles and owls) should take priority for reporting. LHDs may choose to log reports of other bird species if resources allow.

3. **Timing –** Localities can choose to have dead birds reported during the times that yielded the best information in past years. May 1 is the official start of bird testing and July 15 is the official end, but reporting should begin April 1 and end September 30.

4. **Record Keeping -** LHDs should enter all sightings of dead crows, blue jays and raptors in the Access database supplied by the Office of Epidemiology, preferably directly into the web-based system or by emailing files. Directions for the electronic submission of the data will be provided prior to the start of the testing season. All dead birds that are reported should receive a VDH ID number (See III.A.1.).

5. **Individual Sick Birds** should be referred to a wildlife rehabilitator. If a crow, jay or raptor dies under the rehabilitator's care in a locality where dead bird reports are being collected, the rehabilitator should notify the LHD so a record can be made and appropriate birds or swabs submitted for testing.

6. **Database Maintenance -** The Office of Epidemiology will maintain the web-based database, electronically transmit the appropriate bird data to the Centers for Disease Control and Prevention, and post the data on the VDH website in a timely manner.

C. Testing System - Dead Wild Birds

1. **Resources** - LHDs are urged to enlist other organizations to supplement or carry out dead bird testing activities. Possible resources include: wildlife rehabilitators; mosquito surveillance personnel; members of conservation or wildlife groups, especially wild bird societies; animal control agencies; public works departments; or DGIF staff. The Office of Epidemiology and DCLS will target wildlife rehabilitators to assist LHDs in the testing of birds and will provide training on filling out laboratory submission forms and collecting oral swabs. LHDs will still be responsible for entering bird information into the database and facilitating the shipment of specimens via the courier.

2. **Species -** Crows (American and Fish) and blue jays (*Corvidae* family) and raptors (birds of prey, i.e., hawks, falcons, eagles and owls) will take priority for testing because of their sensitivity to mortality from WNV. However, if circumstances dictate and resources allow, LHDs may submit other bird species for testing after consultation with DCLS or the Office of Epidemiology. The LHD should decide whether to have a bird submitted for testing based on species, cause of death, freshness (died within the past 24 hours) and bird and mosquito data that have already been accumulated (See III.C.7.).

3. **Timing –** May 1 is the official start of bird testing and July 15 is the official end, however birds can be tested at any time of year if there are indications that testing results will provide critical information for focusing response activities. It is unlikely that human cases will occur in areas that do not see positive birds prior to mid July.

4. **ID Number and Form** - The ID number (See III.A.1.) must be with the bird or bird swab while in transport. Whoever possesses or transports a bird or bird swab for testing, will be given the ID number for the bird to verify contact was made with the health department. Submission forms created by the database must be in a separate sealed bag within the dead bird container. Dead bird forms should be folded and sealed into a sandwich sized, zip lock bag to protect it from damage by moisture or fluids from the bird specimen(s). Submission forms for avian swab specimens should be folded and placed in the outer pocket of the bag provided with the kit. **Forms must be filled out completely and accurately and ID numbers should reflect the county or city in which**

the bird was found. LHDs should work with non-health department employees who assist in bird or sample collection by providing ID numbers and entering the bird data unless other data management arrangements can be made.

5. **Specimen Collection** - DCLS will test for WNV in wild birds using oral swabs obtained in the field and shipped to DCLS or obtained in the laboratory from whole carcasses that have been submitted. LHDs or designated organizations or individuals should collect oral swabs of appropriate dead birds using kits and a protocol provided by DCLS (See Attachment 1A). An instructional video for the training of LHD staff on proper field swabbing procedure has been made. Please contact the Office of Epidemiology at (804) 864-8141 to obtain a copy of the video. The labeled swab specimens will be transported to the LHD, which will forward them via the DCLS courier service. Alternatively, the swabs can be submitted directly to the laboratory by LHD staff or other designated groups or individuals. Under special circumstances determined by the DCLS and the Office of Epidemiology, bird carcasses may be necropsied at DCLS.

6. **Testing -** For each specimen submitted, DCLS will determine, based on the history associated with the submission whether testing for WNV is warranted. (All testing by Virginia laboratories is dependent on availability or appropriate tests and supplies.) Swab specimens will be submitted according to Attachment 1A and Real-time RT-PCR will be used to detect the presence of WNV RNA. When avian necropsy is necessary brain, heart, liver, and/or kidney will be removed from each acceptable bird and Real-time RT-PCR will be used to detect the presence of WNV RNA. If federal and military installations or other state agencies send birds to the United States Geologic Survey laboratory in Wisconsin or the Southeast Cooperative Wildlife Disease Survey in Georgia, whoever receives those results should rapidly share them with the Office of Epidemiology, which will in turn share them with the appropriate LHDs.

7. **Limits on Bird Testing -** Once a critical number of WNV infected birds are found in a particular geographic area, it becomes evident that WNV poses an increased threat in that area and the information can be used to focus control strategies. Continued bird surveillance in that area will not yield much new information. Therefore, to conserve resources, specimens should no longer be submitted for testing from a geographic area after five to ten positive birds have been found in that area, depending on the size of the area, the previous year's experience and the results of mosquito surveillance. Each jurisdiction should designate multiple geographic areas based on geography, and concentrations of human population density.

Designated geographic areas within any county or city should use rivers or highways as division lines. In rural areas, designated geographic areas should not be less than 100 square miles in size (approximately 10 x 10 miles). If LHDs wish to have further testing performed once the limit of positive birds has been reached in a designated geographic area, DCLS can supply additional testing kits for a fee. The price of each kit will include the kit components and the price of analysis and reporting.

8. **Carcass Handling** - Birds should be handled with gloves or some other means of avoiding direct contact. If bird carcasses are being collected instead of swab samples, bird handlers should be instructed to place each dead bird in a clear (transparent) plastic bag, tie (or zip) it shut and then place in a second appropriately sized leak proof zip-lock bag and seal the bag. No more than one bird should be placed in a bag, and a copy of the bird's submission form should be folded and sealed into a sandwich sized zip-lock bag and be included in the double bag along with the bird. The double-bagged bird can then be placed in a sturdy, waterproof container (one not used for personal food or drink) with a cold pack or ice until collection of the bird occurs by LHD staff or designated groups or individuals. Rabies submissions should not be sent in the same shipping container as arboviral specimens.

   Carcasses from which oral swabs were collected should be disposed of in a landfill or incinerated.

9. **Carcass Storage and Transport -** Birds should be stored on ice or in a refrigerator and should be transported in the presence of a cold pack (preferred) or wet ice. If carcasses are stored more than 24 hours before transporting to the laboratory, they should be frozen (-20° F preferred). Leak-proof, reusable coolers (ice chests) are recommended for purchase by local agencies for bird submissions. The shipping container should be marked with indelible ink with the county name, address, and phone number, so that the laboratory can ship reusable containers back to the local agencies after receiving the birds. "WNV should also be marked on the outside of the shipping container to help rapidly direct the specimens to the appropriate laboratory within DCLS.

10. **Swab Transport -** Swab specimens can be delivered at room temperature if delivery to DCLS is expected within 72 hours from time of collection, otherwise they should be stored in the refrigerator. Swabs that have been left in a car in the sun may give false negative results.

11. **Labeling -** All shipping containers (whole bird or swab) must be clearly labeled on the outside "WNV" so they can be rapidly directed to the

laboratory. WNV Specimens being shipped via the DCLS courier must be clearly marked for the Richmond laboratory.

12. **Groups of Sick or Dead Birds** - Unusual sickness or die-offs of birds should be investigated, but birds that die from WNV are rarely found in groups of more than two. Groups of sick or dead wild birds are more likely to have been exposed to pesticides, poisons or some pathogen other than WNV and should be referred to VDGIF or the nearest VDACS Office of Pesticide Services (OPS) for investigation and determination of suitability for testing. When groups of dead birds are found, VDGIF (main office) should be notified since larger scale mortality may indicate a disease process in the population. If USDA Wildlife Services is called to investigate such an incident, they will communicate findings to OPS and LHD. If testing is recommended, a sample of birds will be transported to DCLS for pesticide and/or WNV testing. In all cases, the LHD and the VDH Office of Epidemiology should be informed of the outcomes of investigations and laboratory testing.

D. Testing System - Asymptomatic Wild Birds

The VDH will work with federal, state, and local agencies to develop the most feasible sentinel bird surveillance program for each geographic area and will support the collection of oral swabs or serologic specimens by local or other state agencies, as resources permit. Emphasis will be placed on testing serologic specimens that have already been taken as part of routine testing rather than taking new specimens, and on using existing mechanisms for collection of wild birds. Emphasis will also be placed on establishing partnerships and training to accomplish specimen collection. Prioritization for sampling and testing will be provided to those counties that are most epidemiologically at risk based on bird migration patterns and evidence of WNV activity from other monitoring.

1. The Virginia office of the USDA, Wildlife Services will identify options for collecting specimens for WNV testing from wild birds killed in connection with wildlife damage projects to protect agriculture, property, and human health and safety throughout the state. The bird species will likely include gulls, crows, Canada geese, feral ducks and geese, starlings, and pigeons. These could include birds removed for nuisance control from landfills and airports, or in local Canada geese roundups. Serum samples collected by USDA Wildlife Services will be tested by NPHL.

2. Live birds tested could also include those maintained in wild bird flocks such as those in zoos and game farms.

3. Mechanisms will need to be developed to distinguish previous from current infections. These may include testing hatch year birds that were not alive

the previous year or requiring a four-fold rise in titer between two specimens taken two weeks apart.